CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER NO. 78-43

AN ORDER TO ADOPT REVISED
WASTEWATER RECLAMATION REQUIREMENTS FOR:

CITY OF FAIRFIELD AND
SOLANO IRRIGATION DISTRICT
SOLANO COUNTY

The California Regional Water Quality Control Board, San Francisco Bay Region, (hereinafter called the Board) finds that:

1. The City of Fairfield owns and is responsible for the operation of a 10.35 mgd advanced wastewater treatment plant serving the Fairfield Suisun City, Cordelia, Travis Air Force Base and the Anheuser-Busch Brewery in Solano County.

2. The Solano Irrigation District and the City have entered into a contract dated January 11, 1974, for seasonal re-use of effluent for agricultural irrigation including food crops. Effluent which is not used for irrigation will be discharged to Suisun Marsh.

3. Section 13523 of the California Water Code provides that a Regional Board, after consulting with and receiving the recommendations of the State Department of Public Health, and if it determines such action to be necessary to protect the public health, safety, or welfare, shall prescribe water reclamation requirements for water which is used or proposed to be used as reclaimed water.

4. The use of reclaimed water by the city and irrigation district could affect the public health, safety, or welfare; requirements are therefore necessary in accordance with Section 13523 of the water code.

5. On 20 August 1974, the Board adopted Order No. 74-63 prescribing wastewater reclamation requirements for the City of Fairfield and the Solano Irrigation District.

6. The Board adopted the Water Quality Control Plan for the San Francisco Bay Basin in April 1975.

7. The water quality objectives for reclaimed wastewater, as set forth in the Basin Plan, specify those limits prescribed in Title 17, Sections 8025 through 8050, California Administrative Code. These have been superseded by Wastewater Reclamation Criteria as defined in Title 22, Sections 60301 through 60357.

8. Section 60357 of Title 22 specifies that alternative methods of treatment other than those described therein may be accepted if the applicant demonstrates to the satisfaction of the State Department of Health that the methods of treatment and reliability features will assure an equal degree of treatment and reliability. The City and District propose to comply with reclamation criteria by such alternative methods. The State Department of Health has made an official determination that the treatment methods and water quality standards required by this Order are an acceptable alternate means of compliance with their reclamation criteria.

9. This Regional Board has notified the city and interested agencies and persons of its intent to revise the wastewater reclamation requirements for the aforementioned parties.

10. The issuance of revised wastewater reclamation requirements for this discharge is exempt from the provisions of Chapter 3 (commencing with Section 21000) of Division 13 of the Public Resources Code in accordance with Water Code Section 13389.

11. This Board at a public meeting heard and considered all comments pertaining to this reuse.

IT IS HEREBY ORDERED, the City of Fairfield and the Solano Irrigation District shall comply with the following:

A. Reclaimed Water Use Specifications

1. The treatment distribution or reuse of reclaimed water shall not create a nuisance as defined in Section 13050(m) of the California Water Code.

2. The use of reclaimed water shall not cause degradation of groundwater suitable for domestic use or cause an increase in any quality parameter that would make groundwater unsuitable for irrigation use.

3. Reclaimed wastewater to be diverted for spray irrigation of food crops shall be at all times an adequately oxidized, clarified, coagulated, filtered and disinfected wastewater and shall meet the following quality limitations:

a) Turbidity

2 JTU	Average during any 24-hour period
5 JTU	Value not to be exceeded more than 5% of the time during any 24-hour period

b) Chlorine Residual

1 mg/l	minimum following 2 hour contact time

Reclaimed water shall not be diverted for this re-use unless compliance with the above limits is assured.

c) Total coliform at any point in the disinfection facilities

2.2 MPN/100 ml	7-day median
23 MPN/100 ml	Maximum

d) 5 day, 20^{o} BOD

10 mg/l	30-day average
20 mg/l	daily maximum

e) Dissolved Oxygen

1.0 mg/l minimum

4. The turbidity of the influent to the tertiary filters shall not exceed 10 JTU whenever effluent re-use includes spray irrigation of food crops.

5. Treatment facilities for reclaimed wastewater to be used for spray irrigation of food crops shall have the following design features:

a. Nominal chlorine contact time shall not be less than 120 minutes based on peak daily flow and modal contact time shall not be less than 90 minutes.

b. Chlorine contact chamber length to width ratio or alternatively, the length to depth ratio, shall not be less than 40:1.

c. Disinfection facilities shall include a high energy, rapid mix system of chlorination.

d. Tertiary filters shall be dual media filters of the following design or equivalent as determined by the State Department of Health:

Media	Depth inches	Effective Size mm	Uniformity Co-efficient
Anthracite Coal	24	1.2-1.5	< 1.5
Sand	12	.55-.6	< 1.5

e. Tertiary filter loading rates shall not exceed 6 gallons per minute per square foot (gpm/ft^2).

6. Reclaimed wastewater diverted for turf nursery irrigation shall at all times be an adequately disinfected oxidized wastewater and shall meet the following quality limits:

a)	Chlorine residual	1 mg/l - minimum
b)	Total coliform	23 MPN/100 ml 7-day median
c)	5-day, $20^{\circ}C$ BOD	10 mg/l 30-day average
		20 mg/l maximum daily
d)	Dissolved Oxygen	1.0 mg/l minimum

B. Receiving Water Limitations

1. The use of reclaimed wastewater shall not cause the following conditions to exist in water of the State at any place:

   a. Visible, floating, suspended or deposited oil or other products of petroleum origin;

   b. Floating, suspended, or deposited macroscopic particulate matter or foam;

   c. Bottom deposits or aquatic growths;

   d. Alteration of temperature, turbidity, or apparent color beyond present natural background levels;

   e. Toxic or other deleterious substances to be present in concentrations or quantities which will cause deleterious effects on aquatic biota, wildlife or waterfowl, or which render any of these unfit for human consumption either at levels created in the receiving waters or as a result of biological concentration.

2. The use of reclaimed wastewater shall not cause the following limits to be exceeded in waters of the State in any place:

a.	Dissolved oxygen	5.0 mg/l minimum. Annual median - 80% saturation minimum. When natural factors cause lesser concentration(s) than those specified above, then this discharge shall not cause further reduction in the concentration of dissolved oxygen.
b.	Dissolved sulfide	0.1 mg/l minimum
c.	pH	Variation from natural ambient pH by more than 0.5 pH units.
d.	NH_4OH	0.025 mg/l annual median; .4 mg/l maximum

C. Provisions

1. Except for direct discharges to surface waters regulated under the National Pollutant Discharge Elimination System, all wastewater from the Fairfield Subregional Treatment Plant shall go to the Solano Irrigation District distribution system, and all flows to the District shall be used for crop irrigation. None of the reclaimed wastewater shall be used for domestic purposes.

2. The Solano Irrigation District shall accept the entire flow from the treatment plant from May 2 through September 21 of each year and shall accept flow to the maximum extent feasible during the periods September 22 through December 1 and March 2 through May 1 of each year provided the effluent meets the relevant treatment requirements and quality standards enumerated in the Reclaimed Water Use Specifications above.

3. a. On or before February 15 of each year the Solano Irrigation District shall submit an irrigation plan consisting of a list and map showing users of reclaimed water, crops to be irrigated and method of irrigation. The District may modify the plan consistent with the requirements of this order provided written notification is submitted to the Executive Officer 10 days prior to implementation. The Executive Officer may withdraw authorization for specific uses or use areas in the event the terms and conditions of this Order are violated.

   b. The District shall make an annual inspection of each secondary user of reclaimed water during the growing season to verify compliance with the use or restrictions of this Order. Any violations shall be reported to this Board in writing within 2 weeks. This written notification shall explain reasons for non-compliance and corrective action taken. A brief report documenting compliance inspections shall be submitted to this Board on or before February 15 of each year.

4. The City shall in the event of control computer shut-down, provide sufficient personnel to operate all units and conduct all required water quality monitoring and analysis specified in the self-monitoring program for the City for NPDES Permit CA0038024.

5. The treatment plant shall be provided with a sufficient number of qualified personnel to operate the facility effectively to meet the requirements of this Order at all times. Qualified personnel shall be those meeting requirements of the regulations for classification of wastewater treatment plants and operator certification as promulgated in Chapter 3, Title 23, Subchapter 14, Sections 2450 through 2485, California Administrative Code.

6. The supervisor of the treatment facility shall possess a Grade V certificate in accordance with Sections 2460 and 2455 of the above mentioned regulations and shall be in attendance at the plant equivalent to a full time basis.

7. Compliance with Provision C.5. and C.6. shall be by November 7, 1978, or prior to initiation of reclamation for spray irrigation of food crops, whichever is earlier. Documentation of compliance shall be submitted to the Board prior to November 15, 1978.

8. Prior to July 30, 1978, the City of Fairfield and Solano Irrigation District shall submit to the Board and State Health Department plans of the reclaimed water distribution system and domestic water system containing sufficient detail to determine adequacy of separation of the systems.

9. Prior to initiation of re-use for spray irrigation of food crops, the City of Fairfield shall submit to the Board and the State Health Department a report documenting compliance with the design provisions and water quality limitations of this Order. Such re-use shall not be initiated without approval of the State Department of Health and the Executive Officer of this Board.

10. Prior to initiation of spray irrigation of food crops, the City shall submit to the Board an operations manual which demonstrates how it will be assured that effluent not meeting the above limitations will not be diverted for re-use. The manual should discuss diversion for lower quality re-use, storage, return for re-treatment, and other appropriate measures.

11. This Order includes items numbered 1 through 8 of the attached "Standard Provisions for the Use of Reclaimed Water" dated March 15, 1973.

12. This Order includes all provisions of the attached "Requirements for Dsign of Reclamation Facilities," dated October 1, 1975.

13. This Order includes all provisions of the attached "Guidelines for Use of Reclaimed Water for Irrigation."

14. Data submitted by the City of Fairfield under terms of their self-monitoring program shall be used to determine compliance with this Order.

15. All requirements of this Order shall become effective immediately with the exception of Provision C.5. and C.6.

16. The Board's Order 74-63 is hereby rescinded.

I, Fred H. Dierker, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on June 20, 1978.

Attachments:
Standard Provisions for
Reclaimed Water 3/15/73
Requirements of Design for
Reclamation Facilities, 10/1/75
Guidelines for Use of Reclaimed
Water for Irrigation

FRED H. DIERKER
Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

MARCH 15, 1973

STANDARD PROVISIONS FOR THE USE OF RECLAIMED WATER

1. This Board requests the user to take note of the comments and recommendations contained in all the correspondence the Board has received and considered concerning this matter, and the Executive Officer is directed to transmit copies of that correspondence to the user.

2. This Board considers "Waters of the State" as defined in Section 13050(e) of the California Water Code to include wastewaters over which the user has lost control.

3. The requirements prescribed herein do not authorize the commission of any act causing injury to the property of another, nor protect the user from his liabilities under Federal, State, or local laws, nor guarantee the user a capacity right in the receiving waters.

4. The discharge of any radiological, chemical, or biological warfare agent or high level radiological waste is prohibited.

5. The user shall file with the Regional Board technical reports on self-monitoring work performed according to detailed specifications as directed by the Executive Officer.

6. The user shall permit the Regional Board or its authorized representative:

   a. Entry upon premises in which an effluent source is located or in which any required records are kept.

   b. Access to copy any records required to be kept under terms and conditions of this order.

   c. Inspection of any monitoring equipment or method required by this order.

   d. Sampling of any discharge.

7. The user shall maintain in good working order and operate as efficiently as possible any facility or control system installed by the user to achieve compliance with the water reclamation requirements.

8. The user shall file with the Regional Board a report on waste discharge at least 180 days before making any material change or proposed change in the character, location, or volume of reuse.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

OCTOBER 1, 1975

REQUIREMENTS OF DESIGN FOR RECLAMATION FACILITIES

1. Flexibility of Design. The design of process piping, equipment arrangement, and unit structures in the reclamation plant must allow for efficiency and convenience in operation and maintenance and provide flexibility of operation to permit the highest possible degree of treatment to be obtained under varying circumstances.

2. Emergency Storage or Disposal. (a) Where short-term retention or disposal provisions are used as a reliability feature, these shall consist of facilities reserved for the purpose of storing or disposing of untreated or partially treated wastewater for at least a 24-hour period. The facilities shall include all the necessary diversion devices, provisions for odor control, conduits, and pumping and pump-back equipment. All of the equipment other than the pump-back equipment shall be either independent of the normal power supply or provided with a standby power source.

(b) Where long-term storage or disposal provisions are used as a reliability feature, these shall consist of ponds, reservoirs, percolation areas, downstream sewers leading to other treatment or disposal facilities reserved for the purpose of emergency storage or disposal of untreated or partially treated wastewater. These facilities shall be of sufficient capacity to provide disposal or storage of wastewater for at least 20 days, and shall include all the necessary diversion works, provisions for odor and nuisance control, conduits, and pumping and pump-back equipment. All of the equipment other than the pump-back equipment shall be either independent of the normal power supply or provided with a standby power source.

(c) Diversion to a less demanding reuse is an acceptable alternative to emergency disposal of partially treated wastewater provided that the quality of the partially treated wastewater is suitable for the less demanding reuse.

(d) Subject to prior approval by the regulatory agency, diversion to a discharge point which requires lesser quality of wastewater is an acceptable alternative to emergency disposal of partially treated wastewater.

(e) Automatically actuated short-term retention or disposal provisions and automatically actuated long-term storage or disposal provisions shall include, in addition to provisions of (a), (b), (c), or (d) of this section, all the necessary sensors, instruments, valves and other devices to enable fully automatic diversion of untreated or partially treated wastewater to approved emergency storage or disposal in the event of failure of a treatment process, and a manual reset to prevent automatic restart until the failure is corrected.

(2) Alarm, short-term retention or disposal provisions, and standby replacement equipment;

(3) Alarm and long-term storage or disposal provisions;

(4) Automatically actuated long-term storage or disposal provisions, or

(5) Alarm and standby coagulation process.

7. Filtration. All filtration unit processes shall be provided with one of the following reliability features:

(a) Alarm and multiple filter units capable of treating the entire flow with one unit not in operation.

(b) Alarm, short-term retention or disposal provisions and standby replacement equipment.

(c) Alarm and long-term storage or disposal provisions.

(d) Automatically actuated long-term storage or disposal provisions.

(e) Alarm and standby filtration unit process.

8. Disinfection.

(a) All disinfection unit processes where chlorine is used as the disinfectant shall be provided with the following features for uninterrupted chlorine feed:

(1) Standby chlorine supply,

(2) Manifold systems to connect chlorine cylinders

(3) Chlorine scales, and

(4) Automatic devices for switching to full chlorine cylinders.

Automatic residual control of chlorine dosage, automatic measuring and recording of chlorine residual, and hydraulic performance studies may also be required.

(b) All disinfection unit processes where chlorine is used as the disinfectant shall be provided with the following reliability features:

(1) Alarm and standby chlorinator;

(2) Alarm, short-term retention, or disposal provisions, and standby replacement equipment;

(3) Alarm and long-term storage or disposal provisions;

GUIDELINES FOR USE OF RECLAIMED WATER FOR IRRIGATION

1. Maximum attainable separation of reclaimed water lines and domestic water lines should be practiced.

   a. The use area facilities must comply with the "Regulations Relating to Cross-Connections," Title 17, Chapter V, Sections 7583-7622, inclusive, California Administrative Code.

   b. Plans and specifications of the existing and proposed reclaimed water system and domestic water system shall be submitted to State and/or local health agencies for review and approval.

2. All reclaimed water valves and outlets should be appropriately tagged to warn the public and employees that the water is not safe for drinking or direct contact. Signs should be in Spanish as well as English if appropriate.

3. Adequate means of notification should be provided to inform the public that reclaimed water is being used. Such notification should include the posting of conspicuous warning signs with proper wording of sufficient size to be clearly read.

4. Irrigation should be controlled to minimize ponding of wastewater.

5. Irrigation should be done so as to minimize contact by the public with the sprayed material.

6. Irrigated areas must be kept completely separated from domestic water wells and reservoirs.

7. Adequate time should be provided between the last irrigation and harvesting to allow the crops and soil to dry.